

What is claimed is:

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1. A laser assembly, comprising:

a source for providing a light along an optical path with any wavelength from a continuous range of wavelengths;

a diffractive element positioned in the optical path and from the source by a first distance to redirect the light;

10 a reflective element positioned in the optical path and from the diffractive element by a second distance to receive the redirected light from the diffractive element, and the reflective element positioned in the optical path and from the diffractive element by the second distance to redirect the light towards the diffractive element; the diffractive element positioned in the optical path and from the source by the first distance to re-direct the light towards the source; and

15 a micro-actuator for selecting the wavelength from the continuous range of wavelengths by altering the optical path of the light.

- 20 2. The laser assembly of claim 1, wherein the first distance and the second distance define an optical path length between the source and the reflective element measured in wavelengths, and wherein the optical path length remains constant over the continuous range of wavelengths.

- 25 3. The laser assembly of claim 2, wherein the micro-actuator is coupled to the reflective element to displace the reflective element.

- 30 4. The laser assembly of claim 3, wherein the displacement comprises an angular displacement.

5. The laser assembly of Claim 4, wherein the angular displacement occurs about a virtual pivot point.

- 35 6. The laser assembly of Claim 4, wherein the displacement comprises a translation and a rotation.

7. The laser assembly of Claim 2, wherein the micro-actuator comprises a micro-machined actuator.

8. The laser assembly of Claim 7, wherein the micro-machined actuator is coupled to the reflective element.

- 40 9. The laser assembly of Claim 8, wherein the reflective element comprises a retro-reflector.

10. The laser assembly of Claim 2, wherein the continuous range of wavelengths comprises from about 1520nm to about 1560nm.

Sub B+ 11. The laser assembly of Claim 10, wherein the wavelength is 1540nm.

12. The laser assembly of Claim 10, wherein the source comprises a Fabry-Perot laser.

Sub A3 5 13. A tunable laser, comprising:

a source means for providing a light along an optical path with any wavelength selected from a continuous bandwidth of wavelengths;

a diffractive element positioned in the optical path and from the source by a first distance to redirect the light;

10 a reflective element positioned in the optical path and from the diffractive element by a second distance to receive the redirected light from the diffractive element, and the reflective element positioned in the optical path and from the diffractive element by the second distance to redirect the light towards the diffractive element; the diffractive element positioned in the optical path and from the source by the first distance to re-direct the light towards the source; and

15 a micro-actuator means for selecting the wavelength from the continuous range of wavelengths by altering the optical path of the light.

20 14. The tunable laser of Claim 13, wherein the source comprises a Fabry-Perot laser.

25 15. The tunable laser of Claim 13, wherein the micro-actuator comprises a micro-machined actuator.

Sub A3 30 16. A method for providing light with any wavelength selected from a continuous range of wavelengths, comprising the following steps:

providing the light along an optical path;

providing a diffractive element in optical path to diffract the light;

providing reflective element in the optical path to reflect the light; and

selecting a particular wavelength of light from the continuous range of wavelengths by altering the optical path through displacement of a micro-actuator.

Sub D47 35 17. The method of Claim 16, further comprising the step of displacing the reflective element with the micro-actuator to alter the optical path.

18. The method of Claim 16, further comprising the step of displacing the reflective element by a translation and a rotation.

19. The method of Claim 16, further comprising the step of displacing the micro-actuator about a virtual pivot point.

Sub A3 40 20. The method of Claim 16, further comprising the step of selecting the particular wavelength from a continuous range of wavelengths comprising the range of from about 1520nm to about 1560nm.